



## Exercise 4.1

**Question 1:**

Complete the last column of the table.

| S. No. | Equation    | Value    | Say, whether the equation is satisfied. (Yes/No) |
|--------|-------------|----------|--------------------------------------------------|
| (i)    | $x + 3 = 0$ | $x = 3$  | -                                                |
| (ii)   | $x + 3 = 0$ | $x = 0$  | -                                                |
| (iii)  | $x + 3 = 0$ | $x = -3$ | -                                                |
| (iv)   | $x - 7 = 1$ | $x = 7$  | -                                                |
| (v)    | $x - 7 = 1$ | $x = 8$  | -                                                |
| (vi)   | $5x = 25$   | $x = 0$  | -                                                |
| (vii)  | $5x = 25$   | $x = 5$  | -                                                |
| (viii) | $5x = 25$   | $x = -5$ | -                                                |
| (ix)   |             | $m = -6$ | -                                                |
| (x)    |             | $m = 0$  | -                                                |
| (xi)   |             | $m = 6$  | -                                                |

**Answer:**

(i)  $x + 3 = 0$

L.H.S. =  $x + 3$

By putting  $x = 3$ ,

L.H.S. =  $3 + 3 = 6 \neq$  R.H.S.



∴ No, the equation is not satisfied.

(ii)  $x + 3 = 0$

L.H.S. =  $x + 3$

By putting  $x = 0$ ,

L.H.S. =  $0 + 3 = 3 \neq$  R.H.S.

∴ No, the equation is not satisfied.

(iii)  $x + 3 = 0$

L.H.S. =  $x + 3$

By putting  $x = -3$ ,

L.H.S. =  $-3 + 3 = 0 =$  R.H.S.

∴ Yes, the equation is satisfied.

(iv)  $x - 7 = 1$

L.H.S. =  $x - 7$

By putting  $x = 7$ ,

L.H.S. =  $7 - 7 = 0 \neq$  R.H.S.

∴ No, the equation is not satisfied.

(v)  $x - 7 = 1$

L.H.S. =  $x - 7$



By putting  $x = 8$ ,

$$\text{L.H.S.} = 8 - 7 = 1 = \text{R.H.S.}$$

∴ Yes, the equation is satisfied.

(vi)  $5x = 25$

$$\text{L.H.S.} = 5x$$

By putting  $x = 0$ ,

$$\text{L.H.S.} = 5 \times 0 = 0 \neq \text{R.H.S.}$$

∴ No, the equation is not satisfied.

(vii)  $5x = 25$

$$\text{L.H.S.} = 5x$$

By putting  $x = 5$ ,

$$\text{L.H.S.} = 5 \times 5 = 25 = \text{R.H.S.}$$

∴ Yes, the equation is satisfied.

(viii)  $5x = 25$

$$\text{L.H.S.} = 5x$$

By putting  $x = -5$ ,

$$\text{L.H.S.} = 5 \times (-5) = -25 \neq \text{R.H.S.}$$

∴ No, the equation is not satisfied.



$$\begin{aligned} \text{(ix)} \quad \frac{m}{3} &= 2 \\ &\frac{m}{3} \end{aligned}$$

L.H.S. =

By putting  $m = -6$ ,

$$\frac{-6}{3} = -2$$

L. H. S. =

 $\neq$  R.H.S.

∴ No, the equation is not satisfied.

$$\begin{aligned} \text{(x)} \quad \frac{m}{3} &= 2 \\ &\frac{m}{3} \end{aligned}$$

L.H.S. =

By putting  $m = 0$ ,

$$\frac{0}{3} = 0$$

L.H.S. =  $\neq$  R.H.S.

∴ No, the equation is not satisfied.

$$\begin{aligned} \text{(xi)} \quad \frac{m}{3} &= 2 \\ &\frac{m}{3} \end{aligned}$$

L.H.S. =

By putting  $m = 6$ ,

$$\frac{6}{3} = 2$$

L.H.S. =  $=$  R.H.S.



∴ Yes, the equation is satisfied.

**Question 2:**

Check whether the value given in the brackets is a solution to the given equation or not:

(a)  $n + 5 = 19$  ( $n = 1$ ) (b)  $7n + 5 = 19$  ( $n = -2$ )

(c)  $7n + 5 = 19$  ( $n = 2$ ) (d)  $4p - 3 = 13$  ( $p = 1$ )

(e)  $4p - 3 = 13$  ( $p = -4$ ) (f)  $4p - 3 = 13$  ( $p = 0$ )

**Answer:**

(a)  $n + 5 = 19$  ( $n = 1$ )

Putting  $n = 1$  in L.H.S.,

$$n + 5 = 1 + 5 = 6 \neq 19$$

As L.H.S.  $\neq$  R.H.S.,

Therefore,  $n = 1$  is not a solution of the given equation,  $n + 5 = 19$ .

(b)  $7n + 5 = 19$  ( $n = -2$ )

Putting  $n = -2$  in L.H.S.,

$$7n + 5 = 7 \times (-2) + 5 = -14 + 5 = -9 \neq 19$$

As L.H.S.  $\neq$  R.H.S.,

Therefore,  $n = -2$  is not a solution of the given equation,  $7n + 5 = 19$ .

(c)  $7n + 5 = 19$  ( $n = 2$ )

Putting  $n = 2$  in L.H.S.,

$$7n + 5 = 7 \times (2) + 5 = 14 + 5 = 19 = \text{R.H.S.}$$

As L.H.S. = R.H.S.,

Therefore,  $n = 2$  is a solution of the given equation,  $7n + 5 = 19$ .

(d)  $4p - 3 = 13$  ( $p = 1$ )

Putting  $p = 1$  in L.H.S.,

$$4p - 3 = (4 \times 1) - 3 = 1 \neq 13$$

As L.H.S.  $\neq$  R.H.S.,

Therefore,  $p = 1$  is not a solution of the given equation,  $4p - 3 = 13$ .

(e)  $4p - 3 = 13$  ( $p = -4$ )

Putting  $p = -4$  in L.H.S.,



$$4p - 3 = 4 \times (-4) - 3 = -16 - 3 = -19 \neq 13$$

As L.H.S.  $\neq$  R.H.S.,

Therefore,  $p = -4$  is not a solution of the given equation,  $4p - 3 = 13$ .

(f)  $4p - 3 = 13$  ( $p = 0$ )

Putting  $p = 0$  in L.H.S.,

$$4p - 3 = (4 \times 0) - 3 = -3 \neq 13$$

As L.H.S.  $\neq$  R.H.S.,

Therefore,  $p = 0$  is not a solution of the given equation,  $4p - 3 = 13$ .

**Question 3:**

Solve the following equations by trial and error method:

(i)  $5p + 2 = 17$  (ii)  $3m - 14 = 4$

**Answer:**

(i)  $5p + 2 = 17$

Putting  $p = 1$  in L.H.S.,

$$(5 \times 1) + 2 = 7 \neq \text{R.H.S.}$$

Putting  $p = 2$  in L.H.S.,

$$(5 \times 2) + 2 = 10 + 2 = 12 \neq \text{R.H.S.}$$

Putting  $p = 3$  in L.H.S.,

$$(5 \times 3) + 2 = 17 = \text{R.H.S.}$$

Hence,  $p = 3$  is a solution of the given equation.

(ii)  $3m - 14 = 4$

Putting  $m = 4$ ,

$$(3 \times 4) - 14 = -2 \neq \text{R.H.S.}$$

Putting  $m = 5$ ,

$$(3 \times 5) - 14 = 1 \neq \text{R.H.S.}$$

Putting  $m = 6$ ,

$$(3 \times 6) - 14 = 18 - 14 = 4 = \text{R.H.S.}$$

Hence,  $m = 6$  is a solution of the given equation.

**Question 4:**

Write equations for the following statements:

(i) The sum of numbers  $x$  and 4 is 9.

(ii) 2 subtracted from  $y$  is 8.

(iii) Ten times  $a$  is 70.



- (iv) The number  $b$  divided by 5 gives 6.  
(v) Three-fourth of  $t$  is 15.  
(vi) Seven times  $m$  plus 7 gets you 77.  
(vii) One-fourth of a number  $x$  minus 4 gives 4.  
(viii) If you take away 6 from 6 times  $y$ , you get 60.  
(ix) If you add 3 to one-third of  $z$ , you get 30.

**Answer:**

(i)  $x + 4 = 9$

(ii)  $y - 2 = 8$

(iii)  $10a = 70$

(iv)  $\frac{b}{5} = 6$

(v)  $\frac{3}{4}t = 15$

(vi) Seven times of  $m$  is 7m.

$$7m + 7 = 77$$

(vii) One-fourth of a number  $x$  is  $\frac{x}{4}$ .

$$\frac{x}{4} - 4 = 4$$

(viii) Six times of  $y$  is  $6y$ .

$$6y - 6 = 60$$

(ix) One-third of  $z$  is  $\frac{z}{3}$ .

$$\frac{z}{3} + 3 = 30$$

**Question 5:**

Write the following equations in statement forms:

(i)  $p + 4 = 15$  (ii)  $m - 7 = 3$

(iii)  $2m = 7$  (iv)  $\frac{m}{5} = 3$



$$\frac{3m}{5} = 6$$

(v)

$$(vi) 3p + 4 = 25$$

$$(vii) 4p - 2 = 18$$

$$(viii) \frac{p}{2} + 2 = 8$$

**Answer:**

- (i) The sum of p and 4 is 15.
- (ii) 7 subtracted from m is 3.
- (iii) Twice of a number m is 7.
- (iv) One-fifth of m is 3.
- (v) Three-fifth of m is 6.
- (vi) Three times of a number p, when added to 4, gives 25.
- (vii) When 2 is subtracted from four times of a number p, it gives 18.
- (viii) When 2 is added to half of a number p, it gives 8.

**Question 6:**

Set up an equation in the following cases:

- (i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. (Take m to be the number of Parmit's marbles.)
- (ii) Laxmi's father is 49 years old. He is 4 years older than three times Laxmi's age. (Take Laxmi's age to be y years.)
- (iii) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. (Take the lowest score to be l.)
- (iv) In an isosceles triangle, the vertex angle is twice either base angle. (Let the base angle be b in degrees. Remember that the sum of angles of a triangle is 180 degrees.)

**Answer:**

- (i) Let Parmit has m marbles.  
 $5 \times \text{Number of marbles Parmit has} + 7 = \text{Number of marbles Irfan has}$   
 $5 \times m + 7 = 37$   
 $5m + 7 = 37$
- (ii) Let Laxmi be y years old.  
 $3 \times \text{Laxmi's age} + 4 = \text{Laxmi's father's age}$   
 $3 \times y + 4 = 49$   
 $3y + 4 = 49$
- (iii) Let the lowest marks be l.



$$2 \times \text{Lowest marks} + 7 = \text{Highest marks}$$

$$2 \times l + 7 = 87$$

$$2l + 7 = 87$$

(iv) An isosceles triangle has two of its angles of equal measure.

Let base angle be  $b$ .

$$\text{Vertex angle} = 2 \times \text{Base angle} = 2b$$

$$\text{Sum of all interior angles of a } \Delta = 180^\circ$$

$$b + b + 2b = 180^\circ$$

$$4b = 180^\circ$$



## Exercise 4.2

**Question 1:**

Give first the step you will use to separate the variable and then solve the equation:

(a)  $x + 1 = 0$  (b)  $x + 1 = 0$  (c)  $x - 1 = 5$

(d)  $x + 6 = 2$  (e)  $y - 4 = -7$  (f)  $y - 4 = 4$

(g)  $y + 4 = 4$  (h)  $y + 4 = -4$

**Answer:**

(a)  $x - 1 = 0$

Adding 1 to both sides of the given equation, we obtain

$$x - 1 + 1 = 0 + 1$$

$$x = 1$$

(b)  $x + 1 = 0$

Subtracting 1 from both sides of the given equation, we obtain

$$x + 1 - 1 = 0 - 1$$

$$x = -1$$

(c)  $x - 1 = 5$

Adding 1 to both sides of the given equation, we obtain

$$x - 1 + 1 = 5 + 1$$

$$x = 6$$

(d)  $x + 6 = 2$

Subtracting 6 from both sides of the given equation, we obtain

$$x + 6 - 6 = 2 - 6$$

$$x = -4$$

(e)  $y - 4 = -7$

Adding 4 to both sides of the given equation, we obtain

$$y - 4 + 4 = -7 + 4$$

$$y = -3$$

(f)  $y - 4 = 4$

Adding 4 to both sides of the given equation, we obtain

$$y - 4 + 4 = 4 + 4$$

$$y = 8$$

(g)  $y + 4 = 4$

Subtracting 4 from both sides of the given equation, we obtain



$$y + 4 - 4 = -4 - 4$$

$$y = -8$$

$$(h) y + 4 = -4$$

Subtracting 4 from both sides of the given equation, we obtain

$$y + 4 - 4 = -4 - 4$$

$$y = -8$$

**Question 2:**

Give first the step you will use to separate the variable and then solve the equation:

$$(a) 3l = 42 \quad (b) \frac{b}{2} = 6 \quad (c) \frac{p}{7} = 4$$

$$(d) 4x = 25 \quad (e) 8y = 36 \quad (f) \frac{z}{3} = \frac{5}{4}$$

$$(g) \frac{a}{5} = \frac{7}{15} \quad (h) 20t = -10$$

**Answer:**

$$(a) 3l = 42$$

Dividing both sides of the given equation by 3, we obtain

$$\frac{3l}{3} = \frac{42}{3}$$

$$l = 14$$

$$(b) \frac{b}{2} = 6$$

Multiplying both sides of the given equation by 2, we obtain

$$\frac{b \times 2}{2} = 6 \times 2$$

$$b = 12$$

$$(c) \frac{p}{7} = 4$$

Multiplying both sides of the given equation by 7, we obtain

$$\frac{p \times 7}{7} = 4 \times 7$$

$$p = 28$$



(d)  $4x = 25$

Dividing both sides of the given equation by 4, we obtain

$$\frac{4x}{4} = \frac{25}{4}$$

$$x = \frac{25}{4}$$

(e)  $8y = 36$

Dividing both sides of the given equation by 8, we obtain

$$\frac{8y}{8} = \frac{36}{8}$$

$$y = \frac{9}{2}$$

$$\frac{z}{3} = \frac{5}{4}$$

(f)

Multiplying both sides of the given equation by 3, we obtain

$$\frac{z \times 3}{3} = \frac{5 \times 3}{4}$$

$$z = \frac{15}{4}$$

$$\frac{a}{5} = \frac{7}{15}$$

(g)

Multiplying both sides of the given equation by 5, we obtain

$$\frac{a \times 5}{5} = \frac{7 \times 5}{15}$$

$$a = \frac{7}{3}$$

(h)  $20t = -10$

Dividing both sides of the given equation by 20, we obtain

$$\frac{20t}{20} = \frac{-10}{20}$$

$$t = \frac{-1}{2}$$

**Question 3:**

Give the steps you will use to separate the variable and then solve the equation:

(a)  $3n - 2 = 46$  (b)  $5m + 7 = 17$  (c)  $\frac{20p}{3} = 40$

(d)  $\frac{3p}{10} = 6$

**Answer:**

(a)  $3n - 2 = 46$

(b)  $5m + 7 = 17$

Subtracting 7 from both sides of the given equation, we obtain

(c)  $\frac{20p}{3} = 40$

Adding 2 to both sides of the given equation, we obtain

$$3n - 2 + 2 = 46 + 2$$

$$3n = 48$$

Dividing both sides of the given equation by 3, we obtain

$$\frac{3n}{3} = \frac{48}{3}$$

$$n = 16$$

$$5m + 7 - 7 = 17 - 7$$

$$5m = 10$$

Dividing both sides of the given equation by 5, we obtain

$$\frac{5m}{5} = \frac{10}{5}$$

$$m = 2$$

Multiplying both sides of the given equation by 3, we obtain

$$\frac{20p \times 3}{3} = 40 \times 3$$

$$20p = 120$$

Dividing both sides of the given equation by 20, we obtain



$$\frac{20p}{20} = \frac{120}{20}$$

$$p = 6$$

Multiplying both sides of the given equation by 10, we obtain

$$\frac{3p \times 10}{10} = 6 \times 10$$

$$3p = 60$$

$$\frac{3p}{3} = \frac{60}{3}$$

(d) 10

Dividing both sides of the given equation by 3, we obtain

$$\frac{3p}{3} = \frac{60}{3}$$

$$p = 20$$

**Question 4:**

Solve the following equations:

(a)  $10p = 100$  (b)  $10p + 10 = 100$  (c)  $\frac{p}{4} = 5$

(d)  $\frac{-p}{3} = 5$  (e)  $\frac{3p}{4} = 6$  (f)  $3s = -9$

(g)  $3s + 12 = 0$  (h)  $3s = 0$  (i)  $2q = 6$

(j)  $2q - 6 = 0$  (k)  $2q + 6 = 0$  (l)  $2q + 6 = 12$

**Answer:**

(a)  $10p = 100$

$$\frac{10p}{10} = \frac{100}{10}$$

$$p = 10$$

(b)  $10p + 10 = 100$

$$10p + 10 - 10 = 100 - 10$$

$$10p = 90$$

$$\frac{10p}{10} = \frac{90}{10}$$

$$p = 9$$



$$(c) \frac{p}{4} = 5$$

$$\frac{p \times 4}{4} = 5 \times 4$$

$$p = 20$$

$$(d) \frac{-p}{3} = 5$$

$$\frac{-p \times (-3)}{3} = 5 \times (-3)$$

$$p = -15$$

(e)

$$\frac{3p}{4} = 6$$

$$\frac{3p \times 4}{4} = 6 \times 4$$

$$3p = 24$$

$$\frac{3p}{3} = \frac{24}{3}$$

$$p = 8$$

$$(f) 3s = -9$$

$$\frac{3s}{3} = \frac{-9}{3}$$

$$s = -3$$

$$(g) 3s + 12 = 0$$

$$3s + 12 - 12 = 0 - 12$$

$$3s = -12$$

$$\frac{3s}{3} = \frac{-12}{3}$$

$$s = -4$$

$$(h) 3s = 0$$

$$\frac{3s}{3} = \frac{0}{3}$$

$$s = 0$$



(i)  $2q = 6$

$$\frac{2q}{2} = \frac{6}{2}$$

$$q = 3$$

(j)  $2q - 6 = 0$

$$2q - 6 + 6 = 0 + 6$$

$$2q = 6$$

$$\frac{2q}{2} = \frac{6}{2}$$

$$q = 3$$

(k)  $2q + 6 = 0$

$$2q + 6 - 6 = 0 - 6$$

$$2q = -6$$

$$\frac{2q}{2} = \frac{-6}{2}$$

$$q = -3$$

(l)  $2q + 6 = 12$

$$2q + 6 - 6 = 12 - 6$$

$$2q = 6$$

$$\frac{2q}{2} = \frac{6}{2}$$

$$q = 3$$



## Exercise 4.3

**Question 1:**

Solve the following equations.

$$(a) \quad 2y + \frac{5}{2} = \frac{37}{2} \quad (b) \quad 5t + 28 = 10 \quad (c) \quad \frac{a}{5} + 3 = 2$$

$$(d) \quad \frac{q}{4} + 7 = 5 \quad (e) \quad \frac{5}{2}x = -10 \quad (f) \quad \frac{5}{2}x = \frac{25}{4}$$

$$(g) \quad 7m + \frac{19}{2} = 13 \quad (h) \quad 6z + 10 = -2 \quad (i) \quad \frac{3l}{2} = \frac{2}{3}$$

$$(j) \quad \frac{2b}{3} - 5 = 3$$

**Answer:**

$$(a) \quad 2y + \frac{5}{2} = \frac{37}{2}$$

$$2y = \frac{37}{2} - \frac{5}{2} = \frac{32}{2} = 16 \quad \left( \text{Transposing } \frac{5}{2} \text{ to R.H.S.} \right)$$

Dividing both sides by 2,

$$y = \frac{16}{2} = 8$$

$$(b) \quad 5t + 28 = 10$$

$$5t = 10 - 28 = -18 \quad (\text{Transposing } 28 \text{ to R.H.S.})$$

Dividing both sides by 5,

$$t = \frac{-18}{5}$$

$$\frac{a}{5} + 3 = 2$$

$$(c) \quad \frac{a}{5} = 2 - 3 = -1$$

(Transposing 3 to R.H.S.)

Multiplying both sides by 5,

$$a = -1 \times 5 = -5$$

$$\frac{q}{4} + 7 = 5$$

(d)



$$\frac{q}{4} = -2 \quad (\text{Transposing 7 to R.H.S.})$$

Multiplying both sides by 4,

$$q = -8$$

$$(e) \quad \frac{5}{2}x = -10$$

Multiplying both sides by 2,

$$5x = -10 \times 2 = -20$$

Dividing both sides by 5,

$$x = \frac{-20}{5} = -4$$

$$(f) \quad \frac{5}{2}x = \frac{25}{4}$$

Multiplying both sides by 2,

$$5x = \frac{25}{4} \times 2 = \frac{25}{2}$$

Dividing both sides by 5,

$$x = \frac{25}{2} \times \frac{1}{5} = \frac{5}{2}$$

$$(g) \quad 7m + \frac{19}{2} = 13$$

$$7m = 13 - \frac{19}{2} = \frac{26-19}{2} \quad (\text{Transposing } \frac{19}{2} \text{ to R.H.S.})$$

$$7m = \frac{7}{2}$$

Dividing both sides by 7,

$$m = \frac{1}{2}$$

$$(h) \quad 6z + 10 = -2$$

$$6z = -2 - 10 = -12 \quad (\text{Transposing 10 to R.H.S.})$$

Dividing both sides by 6,



$$z = \frac{-12}{6} = -2$$

$$(i) \frac{3l}{2} = \frac{2}{3}$$

Multiplying both sides by 2,

$$3l = \frac{2}{3} \times 2 = \frac{4}{3}$$

Dividing both sides by 3,

$$l = \frac{4}{3} \times \frac{1}{3} = \frac{4}{9}$$

$$(j) \frac{2b}{3} - 5 = 3$$

$$\frac{2b}{3} = 3 + 5 = 8 \quad (\text{Transposing } -5 \text{ to R.H.S.})$$

Multiplying both sides by 3,

$$2b = 8 \times 3 = 24$$

Dividing both sides by 2,

$$b = \frac{24}{2} = 12$$

**Question 2:**

Solve the following equations.

$$(a) 2(x + 4) = 12 \quad (b) 3(n - 5) = 21$$

$$(c) 3(n - 5) = -21 \quad (d) -4(2 + x) = 8$$

$$(e) 4(2 - x) = 8$$

**Answer:**

$$(a) 2(x + 4) = 12$$

Dividing both sides by 2,

$$x + 4 = \frac{12}{2} = 6$$

$$x = 6 - 4 = 2 \quad (\text{Transposing } 4 \text{ to R.H.S.})$$

$$(b) 3(n - 5) = 21$$

Dividing both sides by 3,



$$n - 5 = \frac{21}{3} = 7$$

$$n = 7 + 5 = 12 \text{ (Transposing } -5 \text{ to R.H.S.)}$$

$$(c) 3(n - 5) = -21$$

Dividing both sides by 3,

$$n - 5 = \frac{-21}{3} = -7$$

$$n = -7 + 5 = -2 \text{ (Transposing } -5 \text{ to R.H.S.)}$$

$$(d) -4(2 + x) = 8$$

Dividing both sides by  $-4$ ,

$$2 + x = \frac{8}{-4} = -2$$

$$x = -2 - 2 = -4 \text{ (Transposing } 2 \text{ to R.H.S.)}$$

$$(e) 4(2 - x) = 8$$

Dividing both sides by 4,

$$2 - x = 2$$

$$-x = 2 - 2 \text{ (Transposing } 2 \text{ to R.H.S.)}$$

$$-x = 0$$

$$x = 0$$

**Question 3:**

Solve the following equations.

$$(a) 4 = 5(p - 2) \quad (b) -4 = 5(p - 2)$$

$$(c) 16 = 4 + 3(t + 2) \quad (d) 4 + 5(p - 1) = 34$$

$$(e) 0 = 16 + 4(m - 6)$$

**Answer:**

$$(a) 4 = 5(p - 2)$$

Dividing both sides by 5,



$$\frac{4}{5} = p - 2$$

$$\frac{4}{5} + 2 = p \quad (\text{Transposing } -2 \text{ to L.H.S.})$$

$$\frac{4+10}{5} = p$$

$$\frac{14}{5} = p$$

$$(b) -4 = 5(p - 2)$$

Dividing both sides by 5,

$$-\frac{4}{5} = p - 2$$

$$-\frac{4}{5} + 2 = p \quad (\text{Transposing } -2 \text{ to L.H.S.})$$

$$\frac{-4+10}{5} = p$$

$$\frac{6}{5} = p$$

$$(c) 16 = 4 + 3(t + 2)$$

$$16 - 4 = 3(t + 2) \quad (\text{Transposing } 4 \text{ to L.H.S.})$$

$$12 = 3(t + 2)$$

Dividing both sides by 3,

$$\frac{12}{3} = t + 2$$

$$4 = t + 2$$

$$4 - 2 = t \quad (\text{Transposing } 2 \text{ to L.H.S.})$$

$$2 = t$$

$$(d) 4 + 5(p - 1) = 34$$

$$5(p - 1) = 34 - 4 = 30 \quad (\text{Transposing } 4 \text{ to R.H.S.})$$

Dividing both sides by 5,

$$p - 1 = \frac{30}{5} = 6$$

$$p = 6 + 1 = 7 \quad (\text{Transposing } -1 \text{ to R.H.S.})$$

$$(e) 0 = 16 + 4(m - 6)$$



$$0 = 16 + 4m - 24$$

$$0 = -8 + 4m$$

$$4m = 8 \text{ (Transposing } -8 \text{ to L.H.S)}$$

Dividing both sides by 4,

$$m = 2$$

**Question 4:**

(a) Construct 3 equations starting with  $x = 2$

(b) Construct 3 equations starting with  $x = -2$

**Answer:**

(a)  $x = 2$

Multiplying both sides by 5,

$$5x = 10 \text{ (i)}$$

Subtracting 3 from both sides,

$$5x - 3 = 10 - 3$$

$$5x - 3 = 7 \text{ (ii)}$$

Dividing both sides by 2,

$$\frac{5x}{2} - \frac{3}{2} = \frac{7}{2} \text{ (iii)}$$

(b)  $x = -2$

Subtracting 2 from both sides,

$$x - 2 = -2 - 2$$

$$x - 2 = -4 \text{ (i)}$$

Again,  $x = -2$

Multiplying by 6,

$$6 \times x = -2 \times 6$$

$$6x = -12$$

Subtracting 12 from both sides,

$$6x - 12 = -12 - 12$$

$$6x - 12 = -24 \text{ (ii)}$$

Adding 24 to both sides,

$$6x - 12 + 24 = -24 + 24$$

$$6x + 12 = 0 \text{ (iii)}$$



## Exercise 4.4

**Question 1:**

Set up equations and solve them to find the unknown numbers in the following cases:

- (a) Add 4 to eight times a number; you get 60.
- (b) One-fifth of a number minus 4 gives 3.
- (c) If I take three-fourths of a number and add 3 to it, I get 21.
- (d) When I subtracted 11 from twice a number, the result was 15.
- (e) Munna subtracts thrice the number of notebooks he has from 50, he finds the result to be 8.
- (f) Ibenhal thinks of a number. If she adds 19 to it and divides the sum by 5, she will get 8.

- (g) Anwar thinks of a number. If he takes away 7 from  $\frac{5}{2}$  of the number, the result is 23.

**Answer:**

- (a) Let the number be  $x$ .

8 times of this number =  $8x$

$$8x + 4 = 60$$

$$8x = 60 - 4 \text{ (Transposing 4 to R.H.S.)}$$

$$8x = 56$$

Dividing both sides by 8,

$$\frac{8x}{8} = \frac{56}{8}$$

$$x = 7$$

- (b) Let the number be  $x$ .

One-fifth of this number =  $\frac{x}{5}$

$$\frac{x}{5} - 4 = 3$$

$$\frac{x}{5} = 3 + 4 \text{ (Transposing } -4 \text{ to R.H.S.)}$$

$$\frac{x}{5} = 7$$

Multiplying both sides by 5,



$$\frac{x \times 5}{5} = 7 \times 5$$

$$x = 35$$

(c) Let the number be x.

$$\text{Three-fourth of this number} = \frac{3x}{4}$$

$$\frac{3}{4}x + 3 = 21$$

$$\frac{3}{4}x = 18 \quad (\text{Transposing 3 to R.H.S.})$$

Multiplying both sides by 4,

$$\frac{3x \times 4}{4} = 18 \times 4$$

$$3x = 72$$

Dividing both sides by 3,

$$\frac{3x}{3} = \frac{72}{3}$$

$$x = 24$$

(d) Let the number be x.

Twice of this number = 2x

$$2x - 11 = 15$$

$$2x = 15 + 11 \quad (\text{Transposing } -11 \text{ to R.H.S.})$$

$$2x = 26$$

Dividing both sides by 2,

$$\frac{2x}{2} = \frac{26}{2}$$

$$x = 13$$

(e) Let the number of books be x.

Thrice the number of books = 3x

$$50 - 3x = 8$$

$$-3x = 8 - 50 \quad (\text{Transposing 50 to R.H.S.})$$

$$-3x = -42$$



Dividing both sides by  $-3$ ,

$$\frac{-3x}{-3} = \frac{-42}{-3}$$

$$x = 14$$

(f) Let the number be  $x$ .

$$\frac{x+19}{5} = 8$$

Multiplying both sides by  $5$ ,

$$\frac{(x+19) \times 5}{5} = 8 \times 5$$

$$x + 19 = 40$$

$$x = 40 - 19 \text{ (Transposing 19 to R.H.S.)}$$

$$x = 21$$

(g) Let the number be  $x$ .

$$\frac{5}{2} \text{ of this number} = \frac{5x}{2}$$

$$\frac{5x}{2} - 7 = 23$$

$$\frac{5x}{2} = 23 + 7 \text{ (Transposing } -7 \text{ to R.H.S.)}$$

$$\frac{5x}{2} = 30$$

Multiplying both sides by  $2$ ,

$$\frac{5x \times 2}{2} = 30 \times 2$$

$$5x = 60$$

Dividing both sides by  $5$ ,

$$\frac{5x}{5} = \frac{60}{5}$$

$$x = 12$$

**Question 2:**

Solve the following:



- (a) The teacher tells the class that the highest marks obtained by a student in her class is twice the lowest marks plus 7. The highest score is 87. What is the lowest score?
- (b) In an isosceles triangle, the base angles are equal. The vertex angle is  $40^\circ$ . What are the base angles of the triangle? (Remember, the sum of three angles of a triangle is  $180^\circ$ ).
- (c) Sachin scored twice as many runs as Rahul. Together, their runs fell two short of a double century. How many runs did each one score?

**Answer:**

(a) Let the lowest score be  $l$ .

$$2 \times \text{Lowest marks} + 7 = \text{Highest marks}$$

$$2l + 7 = 87$$

$$2l = 87 - 7 \text{ (Transposing 7 to R.H.S.)}$$

$$2l = 80$$

Dividing both sides by 2,

$$\frac{2l}{2} = \frac{80}{2}$$

$$l = 40$$

Therefore, the lowest score is 40.

(b) Let the base angles be equal to  $b$ .

The sum of all interior angles of a triangle is  $180^\circ$ .

$$b + b + 40^\circ = 180^\circ$$

$$2b + 40^\circ = 180^\circ$$

$$2b = 180^\circ - 40^\circ = 140^\circ \text{ (Transposing } 40^\circ \text{ to R.H.S.)}$$

Dividing both sides by 2,

$$\frac{2b}{2} = \frac{140^\circ}{2}$$

$$b = 70^\circ$$

Therefore, the base angles of the triangle are of  $70^\circ$  measure.

(c) Let Rahul's score be  $x$ .

Therefore, Sachin's score =  $2x$

$$\text{Rahul's score} + \text{Sachin's score} = 200 - 2$$

$$2x + x = 198$$

$$3x = 198$$



Dividing both sides by 3,

$$\frac{3x}{3} = \frac{198}{3}$$

$$x = 66$$

Rahul's score = 66

Sachin's score =  $2 \times 66 = 132$

**Question 3:**

Solve the following:

- (i) Irfan says that he has 7 marbles more than five times the marbles Parmit has. Irfan has 37 marbles. How many marbles does Parmit have?
- (ii) Laxmi's father is 49 year old. He is 4 years older than three times Laxmi's age. What is Laxmi's age?
- (iii) People of Sundargram planted trees in the village garden. Some of the trees were fruit trees. The number of non-fruit trees was two more than three times the number of fruit trees. What was the number of fruit trees planted if the number of non-fruit trees planted was 77?

**Answer:**

(i) Let Parmit's marbles equal  $x$ .

5 times the number of marbles Parmit has =  $5x$

$$5x + 7 = 37$$

$$5x = 37 - 7 = 30 \text{ (Transposing 7 to R.H.S.)}$$

Dividing both sides by 5,

$$\frac{5x}{5} = \frac{30}{5}$$

$$x = 6$$

Therefore, Parmit has 6 marbles.

(ii) Let Laxmi's age be  $x$  years.

$3 \times \text{Laxmi's age} + 4 = \text{Her father's age}$

$$3x + 4 = 49$$

$$3x = 49 - 4 \text{ (Transposing 4 to R.H.S.)}$$

$$3x = 45$$

Dividing both sides by 3,



$$\frac{3x}{3} = \frac{45}{3}$$

$$x = 15$$

Therefore, Laxmi's age is 15 years.

(iii) Let the number of fruit trees be  $x$ .

$3 \times \text{Number of fruit trees} + 2 = \text{Number of non-fruit trees}$

$$3x + 2 = 77$$

$$3x = 77 - 2 \text{ (Transposing 2 to R.H.S.)}$$

$$3x = 75$$

Dividing both sides of the equation by 3,

$$\frac{3x}{3} = \frac{75}{3}$$

$$x = 25$$

Therefore, the number of fruit trees was 25.

**Question 4:**

Solve the following riddle:

I am a number,

Tell my identity!

Take me seven times over

And add a fifty!

To reach a triple century

You still need forty!

**Answer:**

Let the number be  $x$ .

$$(7x + 50) + 40 = 300$$

$$7x + 90 = 300$$

$$7x = 300 - 90 \text{ (Transposing 90 to R.H.S.)}$$

$$7x = 210$$

Dividing both sides by 7,

$$\frac{7x}{7} = \frac{210}{7}$$

$$x = 30$$

Therefore, the number is 30.